What is claimed is:

CLAIMS

1. A heat transfer system for use in removing heat from an optical subassembly located in a shell of an optical transceiver module, the optical subassembly including a housing, the heat transfer system comprising:

a heat tongue attached to the optical subassembly to include an interior portion located within the housing and an exterior portion located outside of the housing, the heat tongue being capable of absorbing heat from within the housing;

a heat spreading device having a body made from a thermally conductive material, the body being sized to be received within and in thermal communication with the shell of the optical transceiver module;

a cavity at least partially defined through the body, the cavity being positioned substantially adjacent the heat tongue; and

a thermally conductive slug received within the cavity of the body, the slug being positioned within the cavity to absorb heat from the heat tongue and transfer it to the body of the heat spreading device.

2. A heat transfer system as defined in claim 1, wherein the slug is capable of being initially placed in a variety of positions within the cavity to be capable of absorbing heat from the heat tongue and transferring the heat to the heat spreading device.

3. A heat transfer system as defined in claim 1, wherein the slug is affixed to at least one of the heat tongue and the body of the heat spreading device.

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4. A heat transfer system as defined in claim 1, wherein the housing comprises a hermetic enclosure.

5. A heat transfer system as defined in claim 1, wherein the optical subassembly is a transmitter optical subassembly ("TOSA").

6. A heat transfer system as defined in claim 5, wherein the heat tongue is thermally connected to at least one component located within the TOSA.

7. A heat transfer system as defined in claim 6, wherein the at least one component is positioned on a component platform that is at least partially located within the TOSA, and wherein the heat tongue is affixed to a portion of the component platform.

8. A heat transfer system as defined in claim 6, wherein the at least one component is a laser.

9. A heat transfer system as defined in claim 1, wherein the cavity is defined completely through the body of the heat spreading device.

10. A heat transfer system as defined in claim 1, wherein the heat spreading device is capable of transferring heat received from the thermal slug to the shell of the optical transceiver module.

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11. A heat transfer system for use in removing heat from within a transmitter optical subassembly ("TOSA"), the TOSA being located within a shell of an optical transceiver module, the heat spreader system comprising:

a header assembly defining a hermetic enclosure;

a thermally conductive tongue having a portion located within the hermetic enclosure, the tongue c apable of transferring heat produced within the hermetic enclosure to a portion of the tongue that is located outside of the hermetic enclosure;

a thermally conductive heat spreader having a body in thermal communication with the transceiver shell, the heat spreader including a cavity defined through the body, the cavity being at least partially aligned with the tongue; and

a thermally conductive slug shaped to be received within the cavity of the heat spreader, the position of the slug within the cavity being adjustable before the slug is affixed to the body such that the slug is capable of physically engaging both a surface of the heat spreader body and a surface of the tongue, wherein heat present in the tongue can be transferred to the body.

12. A heat transfer system as defined in claim 11, wherein the slug is affixed to the heat spreader body and the tongue.

13. A heat transfer system as defined in claim 12, wherein a silver epoxy or a solder is used to affix the slug to the heat spreader body and the tongue.

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14. A heat transfer system as defined in claim 11, wherein a thermally conductive polymer is placed between the heat spreader body and the shell of the optical transceiver module to enhance heat transfer between the body and the shell.

15. A heat transfer system as defined in claim 11, further comprising a component platform positioned at least partially within the header assembly, the component platform having at least one component positioned thereon, wherein the component platform is attached to the tongue such that heat that is produced by the at least one component is transferred via the component platform to the tongue.

16. A heat transfer system as defined in claim 15, wherein the at least one component is a laser.

17. A heat transfer system as defined in claim 15, wherein the portions of the component platform and tongue that are positioned within the hermetic enclosure are attached together.

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18. A heat transfer system as defined in claim 11, wherein the shape of the cavity and the slug is substantially trapezoidal.

19. A heat transfer system as defined in claim 11, wherein the heat spreader body comprises a planar slab substantially composed of copper.

20. A heat transfer system as defined in claim 19, wherein the slug is substantially composed of copper.

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21. A method of assembling an optical transceiver module, comprising the acts of:

in a transmitter optical subassembly ("TOSA"), aligning a nose assembly with a laser located on a component platform positioned within the TOSA such that at least some of the optical signals to be produced by the laser can be emitted from the TOSA via the nose assembly;

securing the TOSA within a shell of the optical transceiver module;

securing a thermally conductive heat spreader within the shell such that a cavity formed in the heat spreader is positioned at least partially over a heat tongue connected to the TOSA, the heat tongue capable of receiving heat from the component platform, at least some of the heat having been produced by the laser and conducted to the component platform; and

placing a thermal slug in the cavity of the heat spreader and positioning it such that the thermal slug physically contacts both the heat tongue and the heat spreader, the thermal slug being capable of receiving heat from the tongue and transferring at least some of the heat to the heat spreader.

22. A method of assembling as defined in claim 21, further comprising the act of:

affixing the slug to the heat spreader and to the heat tongue.

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23. A method of assembling as defined in claim 21, further comprising the act of:

interposing a thermally conductive polymer material between the heat spreader and the shell of the optical transceiver module to facilitate the transfer of heat from the heat spreader to the shell.

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24. An optical transceiver module for use in optical communications, comprising:

a transceiver shell containing a transmitter optical subassembly ("TOSA"), the TOSA defining a hermetic enclosure and including:

a component platform attached to the TOSA, the component platform having an interior portion located within the hermetic enclosure on which a laser is located and an exterior portion located outside of the hermetic enclosure;

a heat tongue attached to the component platform to define an interior portion located within the hermetic enclosure and an exterior portion located outside of the hermetic enclosure, the interior portion of the heat tongue being capable of absorbing heat from the component platform and transferring the heat of the exterior portion of the heat tongue; and

a heat spreading device positioned in the transceiver shell, the heat spreading device comprising:

a thermally conductive body having a cavity defined through the body, the body being positioned within the shell such that the cavity is substantially adjacent the exterior portion of the heat tongue; and

a thermally conductive slug sized and configured to be received in the cavity, wherein the slug is in thermal communication with both the exterior portion of the heat tongue and the body such that heat from the component platform that is absorbed by the heat tongue is conducted to the body of the heat spreading device.

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25. An optical transceiver module as defined in claim 24, wherein the slug and the cavity are correspondingly shaped with respect to one another.

26. An optical transceiver module as defined in claim 25, further comprising a flex circuit that is attached to the exterior portion of the component platform.

27. An optical transceiver module as defined in claim 26, wherein the slug is attached to both the exterior portion of the heat tongue and the body of the heat spreading device.

28. An optical transceiver module as defined in claim 27, wherein the heat tongue is comprised of a tungsten copper alloy, and wherein the component platform is comprised of a ceramic material.

29. An optical transceiver module as defined in claim 28, wherein at least one component comprising the TOSA is aligned with an optical path defined through the TOSA before the slug is received by the cavity of the heat spreading device body.

30. An optical transceiver module as defined in claim 29, further comprising a conductive polymer interposed between the heat spreading device and the shell, the conductive polymer assisting with the transfer of heat from the thermally conductive body to the shell.

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31. An optical transceiver module as defined in claim 30, wherein the body of the heat spreading device defines a raised structure about the hole defined in the body, the raised structure configured to ensure adequate spacing exists between the heat spreading device and a printed circuit board positioned in the shell of the optical transceiver module.

32. An optical transceiver module as defined in claim 31, further comprising a hole defined in the body of the heat spreading device for receiving a screw that is configured to attach the body to the shell of the optical transceiver housing.

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